

**TRIPARTITE ASSESSMENT REPORT  
ACCELERATOR DIVISION, COMPUTING SECTOR, AND PARTICLE  
PHYSICS DIVISION  
SPILL PREVENTION, CONTROL, AND COUNTERMEASURE (SPCC)  
IMPLEMENTATION**

**Assessment information**

Start date > 11/14/2011      End date > 3/30/2012      Assessed AD/CD/PPD organization >

Title > SPCC Implementation

Motivation > To review how well AD, CS, and PPD have implemented the requirements of FESHM 8031: Oil Pollution Prevention Chapter and Oil Handling-Oil Pollution Prevention Training. FESHM 8031 addresses the EPA requirements to have a SPCC program. The assessment will review Fermilab's SPCC Program and determine how well AD, CS, and PPD have implemented its requirements.

Category > Scheduled      Frequency > Annual      Type      TriPartite Self Assessment

**Assessment team**

	Name	Fermi ID#	Organization	Title
Lead >	Sylvia Wilson	6051N	AD	AD/EO
Lead >	Amy Pavnica	10683N	CS	CS/SSO/EO
Lead >	Angela Sands	15280N	PPD	PPD/EO
Participant >	Rob Bushek	15007N	PPD	PPD/IH
Participant >	Nathan Duff	15407N	PPD	PPD/RSO
Participant >	Amber Kenney	13477N	ESH	ESH
Participant >	Rick Hersemann	14848V	DOE/FSO	Physical Scientist
Participant >	Dennie Parzyck	9935V	DOE/FSO	Facility Rep

## **Executive Summary**

The scope of this tripartite assessment was the implementation of the Spill Prevention, Control, and Countermeasure (SPCC) Program managed by the Accelerator Division (AD), Computing Sector (CS), and Particle Physics Division (PPD). The tripartite assessment serves as a follow-up to the Department of Energy (DOE) Fermi Site Office (FSO) SPCC Assessment conducted in 2010. With the recent shutdown of the Tevatron in September 2011, Fermilab is going through a transition with the repurposing of tenant and building missions. AD, CS, and PPD were selected to evaluate their oil handling practices and implementation of SPCC requirements as a result of Fermilab's recent mission changes. AD, CS, PPD, and DOE FSO prepared one joint tripartite assessment report to document their assessment activities instead of preparing separate tripartite assessment reports. This report documents the SPCC assessment activities conducted by AD, CS, PPD, and DOE FSO. Fermilab's SPCC Program is conducted in accordance with Fermilab's SPCC Plan, FESHM 8031, and 40 CFR 112.

The assessment was conducted on January 11, 25, and 30 and February 1, 22, and 24 by Sylvia Wilson, AD; Amy Pavnica, CD; Rob Bushek, PPD; Angela Sands, PPD; Nathan Duff, PPD; Amber Kenney, ESH; Rick Hersemann, DOE FSO; and Dennie Parzyck, DOE FSO. The assessment consisted of:

- Inspection of bulk oil storage containers, emergency generators, transformers, other oil-filled operational equipment (OFOE), and associated secondary containment managed by AD, CS and PPD;
- Interviews of oil handlers that conduct monthly inspections: Terry Cross, Dan Darimont, Tom Lassiter, and Rick Zifco (AD); Mike Behnke and Mark Thomas (CS); and Jaime Grado, Karen Kephart, and Pete Simon (PPD); and
- Review of documents including Fermilab's oil source inventory, monthly inspection assessment forms, and training records.

The AD, CS, and PPD SPCC Implementation Programs cover the handling of oil in 55-gallon containers, emergency generators, transformers, and other OFOE; monthly inspections of containers and equipment and their associated secondary containment; cleanup of any oil spills observed; training of oil handlers; and maintenance of inspection and training records. The SPCC Implementation Program is managed well and operates efficiently. All oil handlers interviewed had the required oil handler training and were conducting the required monthly inspections. If necessary, contracts are in place with outside contractors and vendors to clean up oil spills that cannot be controlled by Fermilab's Fire Department.

There is one finding, one notable practice, and several recommendations generated from this tripartite assessment.

## **Objective**

To assess current work practice and determine whether AD, CS, and PPD workers are appropriately implementing the oil handling requirements of FESHM 8031: Oil Pollution

Prevention, the concepts from Oil Pollution Prevention training, Fermilab's SPCC Program and 40 CFR 112. This includes:

- Inspection of bulk oil storage containers, emergency generators, transformers, other OFOE, and associated secondary containment managed by AD, CS, and PPD;
- Interviews of oil handlers that conduct monthly inspections;
- Review of oil handler training records; and
- Review of oil inventory and monthly inspection assessment forms.

## **Scope**

The tripartite assessment began on November 15, 2011, with an opening meeting involving ESH representatives from DOE FSO and ESH representatives from AD, CS, and PPD that would be leading the assessment. John Anderson, AD/SSO, and Eric Mieland, ESH Environmental Protection Manager, described the tripartite assessment process and helped define the scope of the assessment. A schedule and preliminary list of areas to be inspected and oil handlers to be interviewed was established for each division. DOE FSO agreed that one tripartite assessment report would be prepared but AD, CS, and PPD would be responsible for conducting their own inspections, interviews, and document review and preparing their portions of the report to allow for variations in each division's operations. The assessment would determine whether AD, CS, and PPD employees responsible for oil handling duties are adhering to the requirements of FESHM 8031: Oil Pollution Prevention and (FN000450/CR/01) Oil Handling – Oil Pollution Prevention Training.

## **Methodology**

The scope suggests a simple approach to this tripartite assessment in order to explore the various areas. This meant a planning meeting to become familiar with the guiding documents, identification of internal documents for review, and development of a list of questions to help guide the interview process. The interview questions generated were agreed upon by all assessment team members and are provided in the Appendix. It was decided that the division lead member would be asking all the questions from the list and inviting the other team members to explore additional avenues of inquiry based on the answers given. All individuals interviewed were asked the same questions. General observations and condition of the areas that managed oil and their associated secondary containment were noted at the time of the inspection.

## **Process**

The assessment was conducted on January 11, 25, and 30 and February 1, 22, and 24 by Sylvia Wilson, AD; Amy Pavnica, CS; Rob Bushek, PPD; Angela Sands, PPD; Nathan Duff, PPD; Amber Kenney, ESH; Rick Hersemann, DOE FSO; and Dennie Parzyck, DOE FSO. Areas inspected included 55-gallon drum storage areas, emergency generators, transformers, and OFOE. The following areas were inspected and the responsible oil handlers were interviewed:

### **Accelerator Division**

- |                                 |              |
|---------------------------------|--------------|
| • Cross Gallery/Southeast Annex | Tom Lassiter |
| • New Muon Lab                  | Rick Zifco   |
| • MI-40 Transformers            | Dan Darimont |
| • CHL                           | Terry Cross  |

## **Computing Sector**

- FCC Generators/Transformers Mike Behnke and Mark Thomas

## **Particle Physics Division**

- NOvA Surface Detector Building Karen Kephart
- D-Zero Emergency Generator Pete Simon
- ME7 Worm Rob Bushek and Angela Sands
- Lab A Hardstand Rob Bushek and Angela Sands
- CDF Building Jamie Grado

General observations and condition of the areas that managed oil and their associated secondary containment were noted at the time of the inspection. Each division's internal procedures, training records, and completed monthly inspection assessment forms were also reviewed.

## **Narrative**

AD, CS, and PPD are responsible for conducting monthly inspections of areas within their respective divisions that manage oil in 55-gallon drum storage areas, emergency generators, transformers, and OFOE. Monthly inspections are conducted by staff that have completed the required Oil Pollution Prevention training. Training records reviewed were up to date except for one employee in PPD that was out on sick leave. Each division maintains copies of completed monthly inspection assessment forms. Employees interviewed were familiar with the oil handler requirements and were conscientious about conducting their monthly inspections. The following narrative is provided for each respective division:

## **Accelerator Division**

On February 22, 2012, a meeting was held to discuss the AD portion of the tripartite assessment as well as inspect bulk oil storage containers, transformers, and OFOE managed by AD. Assessment team members from AD, ESH, and DOE FSO were present. The following activities occurred:

- Discussion of topics and areas to assess
- Review of the oil source inventory
- Review of 2010 and 2011 completed monthly inspection assessment forms
- Review of AD Oil Handler List and Training
- Review of draft ADSP-08-0301: Identifying and Inspecting Potential Spill Sources
- Inspection of a select number of AD sites that store oil in containers, transformers, and OFOE and interview the responsible oil handler for each site

AD has 40 oil handlers that have completed the required Oil Pollution Prevention training and conduct monthly inspections. Training records reviewed were up to date. Sylvia Wilson maintains copies of completed monthly inspection assessment forms.

On February 22 and 24, 2012, Sylvia Wilson, AD; Amber Kenney, ESH; and Rick Hersemann, DOE FSO inspected AD oil inventory sites Cross Gallery/Southeast Annex, New Muon Laboratory (NML), Main Injector- 40 (MI-40), and the Central Helium Liquefier (CHL). The sites were selected because they represent typical oil inventory sites managed by the Mechanical, RF, Electrical, and Cryogenics Departments in AD. The sites were inspected to verify that oil

was being stored in proper secondary containment, that secondary containment was intact, and that there was no evidence of leaks or stains.

Two 55-gallon drums of oil were located in the Cross Gallery/Southeast Annex Shop. The building provides secondary containment for the oil drums as there are no floor drains or sumps in the shop. There was no evidence of oil leaks or spills in the 55-gallon drums inspected. The Klystrom Transformer and 10 55-gallon drums of oil were located in the NML. There are two floor drains within the NML. The 55-gallon drums were located within secondary containment and there was no evidence of oil leaks or spills. The transformers located at MI-40 are located on a concrete and gravel surface within a concrete diked area. There is a clay liner and collection system sump beneath the gravel. There was no evidence of oil leaks or spills within the diked area. The outdoor storage shed located outside CHL contained 8 55-gallon drums of oil. The storage shed has secondary containment under the floor and there was no evidence of oil leaks or spills. The 55-gallon drums of oil located inside the CHL all have secondary containment and there was no evidence of oil leaks or spills. Most of the OFOE located inside the CHL have been drained of their oil. There was no evidence of oil leaks or spills at the OFOE inspected in the CHL. The following provides a summary of the oil handler interviews responsible for the areas inspected:

**Tom Lassiter, 4851N, Cross Gallery/Southeast Annex, Mechanical Department**

Tom is a mechanical technician. As part of his responsibilities, he conducts monthly inspections for the two bulk oil storage containers located in the Cross Gallery/Southeast Annex. His training is up-to-date. Tom understands the purpose of the FESHM 8031 and is familiar with the inventory and inspection requirements. He knows to watch for various signs of damage or leaks to the oil containers, and how to manage leaks and spills.

**Rick Zifko, 5479N, NML, RF Department**

Rick is a RF technician specialist. He is responsible for conducting monthly inspections of bulk oil storage containers at two locations, i.e., NML and A0. He also maintains RF transformers in both locations. He understands his roles and responsibilities as an oil handler in accordance to the requirements of FESHM 8031, and his training is current.

Amber Kenney asked if the transformer located at the south end of NML was included in the oil inventory. The oil inventory list included a Klystrom Transformer; however, it only included the volume capacity of the transformer reservoir (300 gallon), and not the capacity of the tank, i.e., 250 gallons. Total storage capacity of the transformer is 550 gallons.

**Dan Darimont, 8212N, MI-40, Electrical Department**

Dan is a technical specialist and supervisor. Part of his responsibilities is to conduct monthly inspections of the Main Injector (MI) transformers and bulk oil storage containers for the Electrical Department. In addition to the monthly inspections, Dan conducts bi-weekly inspections of the transformer located at MI-50 (1-2) that has an oil leak. He also documents the leak on his monthly inspection forms. The drain valves surrounding the MI transformers that Dan is responsible for have been outfitted with poly bags and absorbent pads to contain a leak. The MI transformers also have a level alarm. Dan plans on having the transformer at MI-50 repaired during the upcoming shut down. The tripartite assessment team participants asked Dan if he inspects the MI outdoor sumps and if the sumps are included with his monthly inspections. Dan does not inspect the sumps; however, according to the MI Deputy Head, the sumps are included in the department head inspections, and periodic spot checks are conducted by the building manager.

**Terry Cross, 5357N, CHL, Cryogenics Department**

Terry is a technician specialist for the Cryogenics Department. One of his responsibilities is to conduct monthly inspections of the bulk oil storage containers and OFOE at CHL. Jerry Makara, Terry's supervisor, oversees the activities at CHL, and assigns other trained employees to conduct monthly inspections. Terry's training is up-to-date. Terry mentioned that the oil in some of the OFOE located at CHL has been drained; however, this does not include the Rotoflow Skids or the Worthington compressors. The department plans to utilize this equipment for other future experiments. The tripartite assessment participants asked if the Worthington Compressors were included in the SPCC inventory list. It was not obvious that the compressors were included because they were not specified in the list; however, it was later confirmed that the four crankcases on the inventory list were part of the compressors.

## **Computing Sector**

On January 11, 2012, a meeting was held at the Feynman Computing Center (FCC) to discuss the CS portion of the tripartite assessment as well as inspect the emergency generators and transformers located at FCC. Assessment team members from AD, CS, ESH, and DOE FSO were present. The following activities occurred:

- Discussion of topics and areas to assess
- Review of the oil source inventory and its associated secondary containment
- Review of inspection frequency and related documentation
- Review of Oil Handler Training
- Review of FCC Spill Plan
- Inspection of emergency generators and transformers at FCC

Mark Thomas, 7832N, is the Building Manager for FCC as well as the Grid Computing Center (GCC) and the Lattice Computing Center (LCC). He submits the monthly inspection assessment forms into the online database for CS. Mark has not completed the Oil Handler Training but plans to so he can be a backup if Mike Behnke is out. Mike Behnke conducts the monthly inspections and maintains copies of the monthly inspection assessment forms. After the meeting, an inspection was conducted of the emergency generators and transformers located at FCC. The equipment was all locked; there was no evidence of any stains or leaks on the equipment, concrete pads, or ground surface; and there was no standing water within secondary containment.

On January 30, 2012, Mike Behnke, 6304N, was interviewed by Amy Pavnica, CS; Amber Kenney, ESH; and Rick Hersemann, DOE FSO. Mike stated that his oil handling duties are minimal but he performs the monthly inspections of the generators and transformers at FCC, GCC, and LCC. He explained that during his inspections he looks for corrosion on the tanks and oil spots on the concrete and ground surface. Mike uses the inspection checklist from FESHM 8031 and keeps a hard copy of the completed monthly inspection assessment forms and a pdf copy for a period of 3 years. Mike stated that he inspects and checks rental emergency generator units daily when they are on the premises, but does not record the inspections of the rental units. He explained that if he did find a leak or spill he would contain it, if possible, and dial 3131. If a leak is found in any transformers, Mike would contact the FESS electricians and dial 3131, if necessary.

## **Particle Physics Division**

On January 25, 2012, the PPD, ESH, and DOE FSO assessment team inspected PPD oil inventory sites D-Zero, ME7 Worm, NOvA Surface Detector Building and tanker, and the flexitank stored at the Lab A Hardstand. The sites were inspected to verify that oil was being

stored in proper secondary containment, that secondary containment was intact, and that there was no evidence of leaks or stains.

The emergency generator located at D-Zero has secondary containment and there was no evidence of leaks or spills. About 100 55-gallon drums located inside ME7 Worm were stored on pallets with secondary containment. There was no evidence of any oil leaks or spills from drums stored at ME7 Worm. A 5,000-gallon tanker located within secondary containment outside the NOvA Surface Detector Building contained about 2,000 gallons of scintillator oil. There was no evidence of leaks or spills from the tanker. The NOvA detector located inside the building contained about 20,000 gallons of scintillator oil. The detector has secondary containment around it inside the building. The detector has two modules with slow leaks. Each leaking module has a bucket underneath it that is emptied periodically. The flexitank located at the Lab A Hardstand contained about 4,000 gallons of mineral oil within secondary containment. There was no evidence of leaks or spills from the flexitank.

PPD has 20 oil handlers that have completed the required Oil Pollution Prevention training and conduct monthly inspections. Training records reviewed were up to date except for one employee (Wayne Shaddix) who was out on sick leave. Angela Sands maintains copies of completed monthly inspection assessment forms.

On January 30, 2012, Angela Sands, PPD; Rob Bushek, PPD; Nathan Duff, PPD; Amber Kenney, ESH; and Rick Hersemann, DOE FSO interviewed Karen Kephart and Pete Simon. On February 1, 2012, Angela Sands, PPD, interviewed Jamie Grado. The following provides a summary of the oil handler interviews:

**Karen Kephart, 3119N, PPD Office**

Karen is involved in the NOvA project and chose the secondary containment for the near detector surface building. She is weighing options for the underground near detector. She was involved in the detector scintillator oil filling operations. Karen's training is up-to-date but she is not responsible for inspecting bulk oil containers. She does routinely check the module leaks at the NOvA Near Detector. Karen noted that FESHM 8031 requires all employees, users, and subcontractors to be generally familiar with spill response procedures and is curious as to how that is being met. There is a brief mention of general spill response in the Fermilab ESH Handbook, which each new employee and user receives. FESHM 8030: Chemical Releases – Spill Prevention and Response provides detailed spill response information and is available to all employees.

**Pete Simon, 2972N, PPD Project Testing & Commissioning, D-Zero Building Manager**

Pete is the building manager for D-Zero. As part of his responsibilities, he conducts monthly inspections of the bulk oil storage containers at D-Zero. Pete's training is up-to-date. Pete understands the purpose of FESHM 8031, and is familiar with the inventory and inspection requirements. He knows to watch for various signs of damage or leaks to the oil containers and how to manage a spill or leak.

**Jamie Grado, 6576N, PPD Experiment Operations, CDF Building Manager**

Jamie is the building manager for CDF. As part of her responsibilities, she conducts monthly inspections of the bulk oil storage containers at CDF. Jaime's training is up-to-date. Jamie is not completely familiar with the FESHM 8031 but she has completed the required training and understands her monthly inspection responsibilities.

**Conclusions**

The AD, CS, and PPD SPCC Implementation Programs covers the handling of oil in 55-gallon containers, emergency generators, transformers, and other OFOE; monthly inspections of containers and equipment and their associated secondary containment; cleanup of any oil spills observed; training of oil handlers; and maintenance of inspection and training records. The SPCC Implementation Program is managed well and operates efficiently. All oil handlers interviewed had the required oil handler training and were conducting the required monthly inspections. Oil handlers interviewed seemed familiar with the requirements of FESHM 8031 and the inspection responsibilities. If necessary, contracts are in place with outside contractors and vendors to clean up oil spills that cannot be controlled by Fermilab's Fire Department.

There is one finding, one notable practice, and several recommendations generated from this tripartite assessment.

**Findings** See Findings Section at end

### **Notable Practice**

1. The NOVA experiment has been utilizing tertiary containment for leaking detector modules by placing buckets underneath the modules to catch the slow drips, which makes cleanup in the secondary containment much easier.

### **Recommendations**

1. Specific information should be included in the SPCC Inventory List when identifying spill sources and their locations.
2. To minimize oil inventory and reduce the risk of oil leaks and spills, departments should consider switching to 30-gallon drums instead of 55-gallon drums, if possible
3. When temporary emergency generators are brought on site, they should be inspected monthly and the inspection findings should be recorded and filed.
4. Oil handlers should have a trained back-up to conduct their monthly inspections in the event that they are away from the site.
5. The spill response procedures within the ESH Handbook should be strengthened and updated copies of the handbook should be provided to all personnel. Guidance should be added to the ESH page specifically for Scientists/Users as well (e.g. updating the 'Onsite Response to Emergencies' memo included on that page).

### **Documents Consulted**

#### **Sources Consulted:**

1. FESHM 8031, Oil Pollution Prevention Program dated January 2010
2. Spill Prevention Control and Countermeasure Plan dated December 1, 2010
3. DOE/FSO SPCC Assessment Report dated June 2010
4. 40 CFR 112
5. Oil Handler Training (FN000450/CR/01)
6. Oil Handler Training Records
7. Oil Source Inventory
8. SPCC Monthly Inspection Assessment Forms
9. Feynman Computing Center (FCC) Generator Spill Plan
10. ADSP-08-0301, Identifying and Inspecting Potential Spill Sources
11. Interview Questions

12. AD Internal Procedures
13. CS Internal Procedures
14. PPD Internal Procedures

## **APPENDIX**

1. Please provide a general description of your oil handling duties.
2. Have you completed the Oil Handling – Oil Pollution Prevention training?
3. Explain what FESHM 8031: Oil Pollution Prevention is about.
4. How are inspections documented?
5. How often do bulk oil storage containers or OFOE need to be inspected?
6. If you inspect bulk oil storage containers or OFOE, what do you look for during your inspection?
7. What do you do if you find a spill or leak?
8. What do you do with your completed inspection checklists?
9. Who maintains the file for completed inspection checklists?

## FINDINGS

***Finding #1*** Date found > 2/22/12 Citation >  
Found within AD Location > NML  
organization >  
Title > Klystron Transformers  
Description > The entire storage capacity of the NML Klystron transformer was not  
included in the SPCC Inventory List.  
Hazard Minimal Mishap D Type > Environmental  
severity > probability >